I/O upgrade components at this level may include drive arrays and controllers, network interface cards and modems. Once components are selected, the assigned CompuCom Network Systems Engineer will work with agency site management to determine the most appropriate time to launch the upgrades. Once determined, schedules will be established with a Statement of Work outlining the methodology for the upgrade and the estimated requirements to complete the work. Once approved by the site manager, the work will be performed to specification, monitored, and reviewed for acceptance upon completion.

NETWORK OPERATING SYSTEM UPGRADES/APPLICATION SOFTWARE UPGRADES

CompuCom' s Software Upgrade installation will allow an agency to migrate its operating system software and application software products to new versions quickly and efficiently.

All interdependency issues are identified and appropriately addressed so the end-user can quickly be up and running smoothly. Our Network Systems Engineers can configure the new software versions to the customer' s unique environment. The installation can either be performed remotely or at the customer site.

The following is a summary of CompuCom' s methodology when performing Network Operating System and/or Application Software upgrades.

LAN UPGRADE

CompuCom will review the agency' s existing network configuration to determine the number and types of new product(s) that will be needed. Then an upgrade plan will be developed which identifies needed resources and outlines an implementation schedule required to meet the objectives.

CompuCom has the available resources to support the State Computer Store in handling all aspects of network upgrade projects involving hardware or software on client workstations, servers, and active network components. CompuCom will provide both customized and off-the-shelf solutions for automated software distribution that can reduce the time and costs of the upgrade while improving consistency.

WAN UPGRADE

As a fellow user of business-critical, wide-area networks, CompuCom is very sensitive to WAN systems planning. Because of the down-stream user implications a WAN upgrade can bring, this area is extremely important to an agency' s IS department. What could be a relatively minor issue within a Workgroup or campus environment can create immense user downtime across a 5,000-user WAN.

To facilitate systems upgrades, our assigned Network Systems Engineer will work closely with the agency' s IS department to accommodate all established standards within the enterprise. Utilizing a series of tools ranging from systems models to

throughput analysis, our skilled professionals can assist with definition of upgrade requirements. This work enables component and capacity planning by matching products with defined needs. Once completed, site preparation and planning are undertaken, utilizing a project manager to orchestrate the resources required for final implementation.

Since WAN upgrades typically are invasive to production, the agency may elect to have the work performed during " off hours" . Typically, this arrangement provides our Network Systems Engineers with supervised site access over evening or weekend hours. This method allows the upgrade to be perfected in a non-production mode, ensuring business resumption with minimal downtime. Other electives include production-time upgrades when the time and need allow. Because of the sensitive nature of this type of work, each project will be reviewed with a Senior Network Design specialist to determine the most appropriate course of action.

Upon completion of the analysis, a Statement of Work shall be presented to the agency for approval.

ADDITIONALNETWORKOFFERING

Customized installation Plan
A Network System Engineer will work closely with the customer to define the scope of the project, review the current environment, and identify interdependencies among the software.

ProductInstallation
The customer' s operating system and application software are brought up to the latest version.

InstallatION Report
A comprehensive report will identify product name, version, license number, and any other appropriate information regarding all software installed or upgraded.

Orientation
CompuCom will familiarize the agency' s system manager with the basic operation, documentation, and use of the newly installed products and describe warranty and other appropriate service requirements.

OptionalAdvancedConfiguration/Integration
Predefined product parameters are tailored to the agency' s environment-unique characteristics.

E4. STRATEGIC DESIGN

CompuCom' s team of professional System and Consulting Engineers will provide our State Computer Store customers with expert resources to meet their strategic design needs. CompuCom' s engineers have a broad range of experience and expertise in diverse information technology environments including both distributed and host-based architectures. A summary of our Engineers experience and expertise is as follows:

- Technology selection and strategic planning issues, including PC networking technology, host connectivity, wide-area internetworking, advanced hardware and 32-bit operating systems, remote access, and client/server architectures
- Technology briefings on new and emerging technologies, which can aid in the development of long-range IT planning
- Systems analysis, including performance enhancement, tuning, network re-design, and integration of new and existing technologies
- Complete design services in both technical development and project management
- Design of support infrastructures, including network administration and management, help desk design, and procurement and asset management processes

SYSTEM CONSULTATION

CompuCom' s consulting engineers will help you integrate new technologies into your existing environment by emphasizing structured systems development, methodologies, and technical expertise.

CompuCom' s consulting engineers will provide our State Computer Store customers with both pre-acquisition and post-implementation technologies management consulting services. These services include:

- Strategic and tactical long and short-term planning
- Systems analysis and design
- Systems implementation
- Post implementation services
- Capacity planning
- Behavior modeling
- Re-engineering

SYSTEMS PLANNING, SHORT AND LONG TERM

CompuCom' s systems planning, both short and long-term, is designed to provide our State Computer Store customers with an understanding of network management and support principles. These principles outline the business strategies, organizational boundaries, and technical guidelines for maximizing the delivery of networked technologies. CompuCom' s cohesive systems planning strategy will facilitate a cognate approach for agencies as follows:

- Identifying networks and network management strategies in relationship to the core business objectives
- Developing detailed architectures to support those business objectives
- Providing evolution planning which can identify timeline, milestones, staff, and budgetary issues

The Enterprise Planning Model (EPM) - Identifies the goals of the interested operating units and the technical stakeholders and provides a framework for sharing ideas using a common objective. The EPM produces network planning principles that outline business strategies, organizational boundaries, and technical guidelines. EPM also facilitates cross-organizational consensus.

Cross Life Cycle Modeling - The process of developing a clear, global understanding of an anticipated project, its long-term goals, and the best tactics to use in achieving a successful on-time, on-budget delivery, is known as Cross ***Life Cycle Modeling.*** Cross Life Cycle Modeling is vital if the organization is to spend limited resources effectively and invest in efforts that have the highest long-term payback. Working' without such a model can result in poorly timed investments, improper or disruptive project deliveries.

Project Definition and Methodology - CompuCom utilizes a proven internal process called " Addvent" as its technology management solution. **Addvent,** with its emphasis on industry best practices, offers customers a technology management solution that works with their established processes and management practices. Through **Addvent,** CompuCom delivers documented, repeatable, and scalable solutions. This methodology is founded on more than 10 years of delivering successful technology management solutions for large corporate customers. CompuCom' s approach leverages knowledge, expertise, and predictable processes to ensure proper identification and establishment of support structure, reporting, call handling, service levels, and customer expectations.

During the project planning process, CompuCom establishes a project team composed of your account manager(s), service delivery personnel, operations staff, and management. This team engages a number of resources to support the focus and development of the support strategy. By successfully managing the project during the pre-planning and development stages, expectations are established prior to implementation, objectives are clearly stated and documented, and a measurable deployment plan can be defined and carried out.

The Addvent methodology consists of six distinct phases that follow the life cycle of any IT project: Assess, Plan, Design, Test, Implement and Support. This phased model is used to develop and deliver information technology solutions to large, complex organizations. Addvent recognizes that the deployment and management of information technology is ever-changing, and that most IT environments are simultaneously managing multiple initiatives all at various phases. Addvent' s modular design allows CompuCom to enter into a project at any point and continue its execution. Inherent in each phase is a set of distinct inputs, prerequisites, activities, quality control points, and defined deliverables. These checks and balances help ensure completion of a particular phase before moving to the next phase.

The following are brief definitions of the six phases of Addvent.

Assess	This phase is designed to provide your organization with a high-level understanding of the recommended solution and demonstrate how it will be incorporated into your existing infrastructure. Your business and IT goals combined with data related to your current infrastructure are compiled. Based on this information, a strategic review of your corporate vision and functional requirements is conducted.
Plan	Using the findings from the initial assessment, the procedures and tactical plan(s) necessary to complete the project are refined and developed. Deliverables from this phase include timelines, staffing requirements, and estimated costs of hardware, software, and resources associated with deployment.
Design	In this phase, the IT solution is designed and engineered. Deployment handbooks are created to document the design, standards, installation, and ongoing administration of the new technology considering your business objectives and technical goals. These handbooks describe how CompuCom moves your organization to the new environment and how the environment will function and be managed once the project is completed.
Test	A key part of any design is the testing of the solution. This phase uses a target pilot group to test the deployment procedures and the final product. The goal of this phase is to ensure the engineered solution meets all the technical and business goals defined in the Assess phase.
Implement	Once testing is successfully completed, the solution is rolled out to your end-user environment. Various levels of technical documentation and training services are used to guide the deployment of and the migration to your new technology.
Support	in this phase, the ongoing management and support of the solution is addressed. Issues such as service level compliance, end-user satisfaction, change management, and continuous improvement are evaluated on a regular basis and any deviations from the pre-defined standards are resolved.

Addvent utilizes a set of standard components that add a unique value to CompuCom' s methodology. The components are:

Templates	Each phase includes a set of templates designed to outline the necessary processes to be completed for each of CompuCom' s service areas. These templates serve as a starting point for structuring and delivering a customized solution.
Resources	In order to complete each phase and deliver a customized solution, CompuCom must engage the appropriate people with the applicable skill set. To ensure this matching occurs, each phase has a pre-defined set of roles and responsibilities necessary to complete the phase.
Activities	To ensure quality and consistency, CompuCom utilizes activity lists to guide the resources for each service offering within each phase. These activity lists provide the framework for engaging resources, gathering information, and for engineering, implementing, and supporting the solution.
Deliverables	Vital to the success of any project is effective and continuous communication. Each phase has a set of primary deliverables and a set of supporting deliverables to facilitate the success of the primary deliverables. The primary deliverables are the ultimate project solution or objective. The supporting deliverables provide the documentation for the environments, the operational guidelines, the service level agreements, and the metrics for how CompuCom and your organization will continue to operate after the prime deliverable is operational. Within every CompuCom service offering, each of the required supporting deliverables is pre-defined in a template format and is delivered as part of the prime deliverable to your organization. Supporting deliverables include, but are not limited to: • Product Certification Guides • Co-Managed Guides • System Deployment Handbooks • Desktop Development Handbooks • Service Level Dashboards • Service Level Definition and Reporting Documents • Service Level and Operational Reviews

SYSTEMS ANALYSIS

As any major enterprise network grows, several specific performance issues including appropriate protocol usage, file and print service configuration, load balancing and physical network topology should be investigated before expansion can efficiently take place. CompuCom' s systems analysis will result in a comprehensive report that:

- Thoroughly reviews the network
- Identifies existing and potential problem areas
- Provides corrective suggestions in the context of the existing network
- Provides suggestions and a framework for ongoing network capacity expansion

Assessment of Existing Environment – CompuCom' s consultants will meet with their customers to gain a clear understanding of the overall configuration, layout, and history of the network. During this meeting CompuCom will request and gather information, documentation, drawings, and other information relating to system analysis. This information will greatly assist the systems engineers' performance and effectiveness. To this end, the ordering agency' s personnel are encouraged to actively participate in all phases of the systems analysis.

DATA COLLECTION

Server Configuration – Server platforms and configurations will be examined for suitability in the existing network environment and for support of the network operating system and directory design. This examination will include system loading, memory and processor utilization, and adapter card population. All hardware, adapter cards and their applicable settings will be examined. Any present or potential problems identified will be documented.

Network Operating System Configuration – CompuCom will examine fundamental aspects of the file server implementation. All client information, including user accounts, group assignments, print servers and print queues will be evaluated. Current potential problems and conversion issues involving NetWare 4.x/NDS/Microsoft NT Server compatibility will be investigated.

Network-Based Communications Services – All communications servers and telecommunications connections in use by the network will be evaluated. This includes RAS/NACS, T-l, Fractional T-l and Leased Line connections to remote sites. Microwave connections, modem equipment, file server, and/or network management pager schedules will be checked for stability and proper operation. This will include all hardware and software components. Proper routing and bridging functionality will be evaluated. CompuCom will resolve known, outstanding functional problems, including spanning tree functions between redundant links. The current network communications sub-system will be documented, and recommendations will be made for enhancements and upgrades to meet anticipated network usage.

Cable Plant and Physical Plant Considerations – CompuCom will install and configure existing analysis equipment (such as Lantern and Sniffer Network Management System software) to monitor traffic and cable utilization on the cable plant. Sample data will be taken at strategic points during the business cycle to accurately represent the traffic patterns on the network. CompuCom will then make recommendations for optimizing existing components and for forecasting future needs.

Business Continuation – CompuCom will meet with the agency' s IT staff to identify critical system components and develop a business continuation plan to be implemented in the event of a critical network failure. Any recommendations arising from this meeting will be included in the final report. Consideration will be given to the network design as a whole to minimize the possibility of a catastrophic failure.

Network Printing Facilities -Workstation, server and direct-connect print servers will be evaluated as to their optimal use of network resources, compatibility with the network operating system, and for migration options to standardized services and protocols. Recommendations will be provided in the final report.

DATA ANALYSIS

CompuCom engineering resources will analyze collected data to isolate areas requiring further attention. Any existing network problems found by CompuCom will be completely documented as to source and contributing factors. Recommendations for problem resolution will be documented.

CompuCom may also make recommendations, where appropriate, on improving network performance related to factors outside of the project scope. Any such recommendations will be documented and provided in the final report.

Futures and Expandability – Because expanded automation will likely increase network load, CompuCom will estimate the ability of the current system to withstand increased usage and report on its potential expandability.

CompuCom will make specific recommendations on hardware and software modifications/additions required for optimal future growth. These recommendations will be based on the State' s information regarding planned system expansion. All costs associated shall be based on State prices set forth in RFP DGS-9014.

Final Report Deliverable – Once the analysis of gathered data is complete and all recommendations have been researched and documented, CompuCom will prepare a final report. This report will include all the information detailed above' and will represent the scope of effort for this project. All supplemental documentation collected during the study will also be attached to the report. CompuCom will submit a draft of this report documentation to the ordering agency for review.

SYSTEMS IMPLEMENTATION

A system implementation is a complex project that demands proper planning and management to avoid delays and downtime, and to deliver an effective solution. Whether you are upgrading or replacing your system, CompuCom can skillfully manage all aspects of your project to a successful completion.

Project Management
A dedicated project manager will plan and coordinate the agency' s implementation using CompuCom' s own project management system. This sophisticated methodology employs extensive documentation such as chronological tracking lists, PERT diagrams, and GANTT charts.

The CompuCom project manager will update the Project Management System on a weekly basis and make it available to the customer. This will ensure that everyone involved is up-to-date and in full agreement on timetables, scope, completion of goals and expectations.

Pre-Implementation Staging
In order to minimize disruption to the agency' s work environment, CompuCom will assemble and test new systems at a designated location and deliver them to the point of use in a fully operational state.

Equipment Procurement/Acquisition
In order to establish a single point of accountability and streamline the administrative process, CompuCom will coordinate the procurement of all hardware and software components - even if not purchased from the State Computer Store.

System Conversion
CompuCom' s project plan will include a detailed system conversion schedule that will include:

- Pre-conversion set-ups and checks
- Conversion plans
- Post-conversion testing
- Refinements and fine-tuning
- Ongoing maintenance
- Cut-over schedule
- Parallel run of new and old system

System Training
CompuCom' s Certified Instructor Specialists will train end-users, administrators and supervisors on all aspects of the system.

System Performance Reporting

At the end of the project, CompuCom's Project Manager will present the ordering agency with a full report and presentation on the new system' s performance and what was achieved during the project. The same pattern that was used in the original systems analysis will be used for the evaluation.

TECHNOLOGY ASSESSMENT

The goal of the technology assessment is to determine the status, nature, and characteristics of the existing system. This is answered by performing a survey of the network' s current state: size, capacity, and scalability. The information gathered in the assessment is then compared to the desired or proposed configuration of the network. The difference, or gap, forms the basis of a blueprint for architectural re-engineering.

Technology Assessment is composed of what CompuCom refers to as units of discovery, analysis, and modeling tasks. The assessment delivers a clear perspective on:

- The details of the current architecture' s structure
- The operating condition of that structure
- Anticipated shifts in the computing utility
- A general architecture to support those shifts
- A detailed view of the required architecture to deliver a stable computing utility

F4. NETWOR' K MANAGEMENT/ADMINISTRATION

Network availability is critical in a distributed IT environment. When your network is down or operating inefficiently, end-user productivity plummets.

CompuCom's Network Management/Administration team focuses solely on cost-effective solutions to proactively monitor, administer, and optimize your network performance. Designed to provide a range of support, this service allows your IT department to increase network reliability while reducing downtime. Proactive administration and support allows our customers of the State Computer Store to focus on core strategic issues, not reactive support operations. The Network Management/Administration team consists of experienced connectivity, operating system, and hardware professionals utilizing the most up-to-date network management tools available today.

CompuCom has provided network management and design, and has installed network management systems throughout the U.S., Europe, Africa, and Australia for companies such as Olivetti, Bell Atlantic, Memorex-Telex, US West, and NYNEX. Scopes range from branch-office solutions to enterprise-wide management systems. CompuCom has successfully implemented and managed a wide variety of devices and network operating system environments including Novell NetWare, IBM LAN Server, Microsoft LAN Manager, Windows NT, Windows 95 and Windows 98. Our development team, by providing middleware solutions, has allowed us to provide excellent and cost-effective solutions for managing and monitoring Windows NT.

Before a solution is delivered to our customers or business partners, the solution has been installed, tested and/or prototyped in our Network Control Center where we offer high-level remote network monitoring and administration services to a diverse customer base.

MANAGEMENT/ADMINISTRATION FRAMEWORK

Instead of being tied to a single tool or vendor, CompuCom utilizes a cohesive Network Management/Administration Framework as a structure where " best of breed" tools can be used in a modular and fully integrated fashion. Regardless of the environment, our solutions must provide the following core functionality:

- **NON-INTRUSIVE PRESENCE** in a monitored environment
- Proactive **DETECTION** of conditions
- Centralized, cohesive, and simple **PRESENTATION** of information
- Expert, integrated, detailed support **INFORMATION** and tools
- Flexible **NOTIFICATION** options
- Native **RESOLUTION** tools that are simple to use for all applicable environments

- Highly detailed **REPORTING** capabilities

CompuCom Network Management/Administration focuses on boosting end-user productivity by increasing system reliability. Proactive detection and predictive/capacity planning enable corrective action and make mission-critical systems to be more reliable and better performing.

By proactively managing systems, server conditions can be corrected before they impact end-user productivity. Proactive management also includes planning for the future growth of mission critical systems. CompuCom' s advanced network management/administration enables accurate forecasting and capacity planning so maintenance and upgrades can be scheduled properly, thereby reducing reactive patches and fixes to a system that has failed or run out of resources. Benefits to our State Computer Store customers include:

- Reduction of network downtime and increased end-user productivity
- Increased network manager/support staff productivity and leveraged expertise
- Minimal amount of capital equipment required for efficient network operation
- Protection of investment through intelligent upgrade options determined by using site-specific knowledge and historical trend analysis

NETWORK MANAGEMENT/ADMINISTRATION SUPPORT SERVICES

CompuCom's on-site network management consultants specialize in designing, testing, implementing, and operating advanced network management systems. Our network management/administration solutions range from a single-agency site to proactive monitoring of enterprise-wide networks. CompuCom' s practical, hands-on experience applies to distributed management technologies, deployment strategies, and operational processes.

On-site management consulting provides flexible access to network engineers. Engineers are available for short or long-term assignments to supplement an agency' s information systems staff for projects such as adding/deleting users, controlling space, and recommending system improvements.

Flexible Options
CompuCom' s certified engineers offer multi-vendor network skills to State Computer Store customers. CompuCom' s flexible offerings provide the technical options for any agency' s network environments or specific business needs.

Adding Users
User accounts are added to the network with the appropriate account permissions such as " Read Only" and " Write" access to files and applications. New users are monitored for security compliance.

Deleting Users

CompuCom, upon valid request, can delete user accounts from the network. Depending on the operating system, the user account is usually disabled for several days prior to its deletion. This enables supervisors or administrators to review the account and, if necessary, easily restore it to operation.

Control Space

Most network operating systems can limit storage space by user account. Space restrictions defined by the agency are applied when the user account is created. Users may request additional storage space, but may be subject to an account review to determine whether more space is needed, or if better space management is necessary on the user' s part.

Make Recommendations for System Enhancements and Improvements

CompuCom engineers can provide various consulting services to meet the agency' s needs. Examples of these services are recommendations to optimize network performance, adding a new technology such as imaging, or completely re-designing the network infrastructure. CompuCom engineers will outline the agency' s options detailing the drawbacks and advantages to each option with cost analysis.

First Contact for Problems

CompuCom's help desk will be the first point of contact for problem resolution. This service can be customized to fit an agency' s individual needs and is available up to 24 hours a day, seven days a week. CompuCom will manage the entire problem/resolution process beginning with the initial call to the Help Desk. After determining the nature of the call, the Help Desk can either resolve the problem immediately or escalate it for dispatch to an on-site engineer. Most software application questions or configuration problems can be resolved by the Help Desk. Hardware-related problems typically require on-site attention.

Performance Tuning

In monitoring the agency' s network, CompuCom can perform tuning operations to ensure maximum performance from the network.

Continuous Monitoring

CompuCom can install state-of-the-art-monitoring equipment appropriate for an agency' s environment. Data sampling is periodically collected 24 hours a day, seven days a week from a remote location. If an error occurs or a pre-set threshold is exceeded, a CompuCom network specialist is alerted immediately via dial-up modem line. The agency is then informed of alert and alarm conditions according to the terms of their agreement.

Remote Diagnosis

Network software/hardware experts are available to aid in problem identification and resolution. Support is provided either over the telephone or via remote LAN Interfaces.

Software Maintenance

As part of our network management/administration capabilities, we can remotely update an agency' s software with the latest version.

Monthly Reporting

Detailed reports containing a summary and analysis of LAN activity will give an agency a clear picture of areas requiring improvement. An agency can learn when the greatest demands are made on its network, whether they are approaching maximum bandwidth consumption, and whether random network errors are affecting operations.

LAN System Audit

In order to manage, maintain, and plan for a LAN or network, it is essential to have a good working knowledge of what can and will go wrong. Having a complete listing of all components helps immeasurably. Our IAN, System Auditing service evolved as a result of the need to understand and stabilize a client environment in order to apply proper network management/administration techniques. The CompuCom LAN System Audit provides a comprehensive and detailed study of the network environment. While our audit service is File Server-centric, we thoroughly examine all LAN System components in order to:

- Evaluate and analyze performance, configurations and procedures
- Uncover possible security risks
- Identify potential shortfalls or exposures that may exist in disaster recovery plans

The interdependency and correlation between all of these systems is usually overlooked. Our process envelops and consolidates this information in order to view the entire interrelated environment. An audit is a vital part of proactive file server and network management/administration that provides a comprehensive understanding of the working environment. This understanding is an invaluable and necessary precursor to providing the means to analyze inefficiencies as well as the ability to intelligently plan for growth and change. Information is obtained through expert auditing tools, direct observation of manual procedures, and support staff interviews.

The following LAN system components are examined:

- File server system hardware
- Network operating system (NOS) configuration
- Workstation configuration / Inventory
- Loss prevention systems
- Physical Environment / Support Staff
- Cable Plant

CompuCom divides the audit into four logical components: hardware, software, security and environment.

The hardware portion of the LAN system audit is designed to qualify and quantify current hardware configurations. This is done in order to make recommendations to enhance server performance and disaster recovery plans. This information provides a thorough server and workstation inventory that can aid in budgeting, system upgrade planning, and future network designs. Our procedure is non-intrusive and largely invisible to the user population.

The software portion of the file server audit is designed to analyze the configuration of the NOS as well as to investigate the revisions of all relevant server utilities, drivers, and programs. Improper configuration of the NOS can cause problems in many different and seemingly unrelated areas. Analysis of workstation information, especially with respect to LAN driver revision/configuration and memory configuration, can also provide insight into problematic trends. Older revisions of software may have inherent problems that could hinder the performance of the file server or cause unnecessary down time.

Security is evaluated for the file server. A security report is generated to evaluate the configuration of file server user access. The security report will evaluate the following areas of concern:

- Supervisory (unrestricted access) accounts and exceptions
- Password requirements (change intervals, maximum and minimum lengths, exception reports)
- Password encryption
- Time restrictions and intrusion reports
- Virus Protection capabilities
- System access points (dial-in links, routed links)

The LAN environment is of great importance and should be a controlled environment. Focus is on the file server operating environment since it is of mission-critical importance. The following are checked:

- Heating and cooling systems
- Humidity control
- Power and conditioning
- Static electricity
- Flooring concerns (raised floor, carpeting)
- Server room security

A basic traffic analysis is also performed that provides a fundamental network characterization. Problems such as a bad network interface, board, faulty cabling, excessive errors, or high utilization may be identified during this analysis. This basic audit is meant to provide a general snapshot of the health of the cable plant.

All of the collected data and recommendations are documented in an audit report for customer review. It is provided in hardcopy and/or in preferred file format.

G4. NETWORK TROUBLESHOOTING

PROBLEM IDENTIFICATION AND CORRECTION

Our Network Systems Engineers are experts and experienced in isolating and resolving network problems. Once the problem has been detected, CompuCom will dispatch a Network Systems Engineer to resolve the problem. Our Network Systems Engineers are supplied with the most powerful network analysis technology including the Network General Sniffer with Ethernet, Token-Ring, and WAN capabilities. In addition, each geographic region maintains an assortment of Microtest cable scanners for testing a variety of cable types including IBM types 1,2, and 3, and unshielded twisted pair cabling used in 10 Base-T and 100 Base-T Ethernet systems. Each region also provides laptops that enable the Network Systems Engineers to obtain the latest driver fixes on CompuServe Network Performance Reporting Capabilities.

Troubleshooting activity includes:

- Troubleshooting physical layer and data-link layer problems (Token Ring);
- Performing traces for resolving difficult or intermittent problems;
- Troubleshooting LAN driver, memory or other problems emanating from the workstation; and
- Examining file server statistics (e.g., if Novell: VOLINFO, MONITOR, and RCONSOLE) and making appropriate recommendations regarding the need for increased system resources.

ON-LINE REMOTE DIAGNOSTICS & TROUBLESHOOTING

CompuCom can also provide remote network diagnostics and troubleshooting. This service requires the customer to install a qualified modem and software to use in providing remote diagnostics and troubleshooting. Types of services that may be provided, but are not limited to, include:

- Data Recovery
- Data Manipulation
- Software Updates
- Problem Analysis
- System Operation Evaluation

NETWORK SYSTEM CHECK-UP

A THOROUGH ASSESSMENT OF YOUR NETWORK ENVIRONMENT

CompuCom' s Network System check-up is the quickest, most cost-effective way to identify security and performance problems before they affect your agency' s critical business operations.

CompuCom' s Network System check-up is time-saving, cost effective, and will provide your agency with a broad but thorough assessment of your LAN-based environment. Advanced, expert system-based tools are used to collect information on your LAN configuration. The collected data is analyzed against accepted practices, and the findings, together with recommendations for corrective action, are documented in a summary report. A CompuCom engineering specialist will review and discuss these findings with you.

The comprehensive offerings include:

- ***Data*** Collection ▪ CompuCom' s expert system-based software tools are used to collect information about stand-alone or clustered systems, or about LAN-based servers.
- ***Data Analysis*** ▪ Using sophisticated knowledge-based systems, CompuCom' s technical specialists analyze the collected data, comparing your environment against system- or LAN-management rules and practices.
- Network ***System Check-Up Report*** ▪ A summary report details the findings of the network system check-up analysis; highlights conditions that require immediate resolution or more in-depth examination; and recommends appropriate actions.
- ***Follow-up Consultation*** ▪ In an on-site or telephone consultation (depending on your choice of service options), a CompuCom specialist provides a comprehensive technical review of the results of your network system check-up.

SOFTWARE SERVICES

In today' s multi-vendor world, even the simplest computing environment can experience interoperability problems. These problems are compounded by the need to interact with other multi-vendor environments. CompuCom responds with comprehensive and flexible software support services. These services include:

- ***Over the Telephone Troubleshooting*** ▪ for quick diagnosis and resolution of software interoperability problems.
- ***Symptom-Solution Database*** ▪ for accessing information about known software problems and fixes.

- ***On-line Bulletin Board Access*** - for staying abreast of time-critical technical information, plus tips on getting the most from your system.
- ***On-site Support*** - for resolving software problems that cannot be handled remotely.

14. WARRANTY SERVICES

STATEWIDE SERVICE -WE ARE EVERYWHERE YOU ARE

With more than five years experience managing the State Computer Store and serving our government customers in California, CompuCom is recognized as an industry-leading organization dedicated to providing the finest in PC-related support services throughout the state. With six service locations strategically placed in California and partnerships with leading service and support providers, more than 450 multi-vendor certified engineers statewide, CompuCom is positioned to provide warranty and repair services in all customer locations throughout California. CompuCom will continue to serve as the single point of contact for all State Computer Store customers; removing the burden of managing multiple service providers, and ensuring that you continue to receive consistent delivery of support services.

CompuCom will support all the equipment it sells through the State Computer Store according to original equipment manufacturer (OEM) warranties and guarantees. CompuCom agrees to honor all manufacturer warranties and guarantees on all products offered through the State Computer Store including on-site warranty. CompuCom only uses OEM parts for repairs.

CompuCom will ensure that each of our State Computer Store customers receives the full benefit of their warranties and will provide a documented, audible record of the services performed to each of our customers for review.

COMPUCOM STATEWIDE SERVICE AND SUPPORT LOCATIONS

Sacramento
10415 Old Placerville Road, Suite 235
Sacramento, CA 95814

Santa Clara
386 S. Abbott
Milpitas, CA 95035

Los Angeles
801 South Grand Ave. Suite 1020
Los Angels, CA 90017

San Ramon
2603 Camino Ramon, #110
San Ramon, CA 94583

Corona
1180 Olympic Drive, Suite 106
Corona, CA 92881

San Diego
1551 Fourth Avenue, Suite 305
San Diego, CA 92101

A VARIETY OF SERVICE DELIVERY OPTIONS

Dispatch Support -Through dispatch support, engineers provide an array of services, including warranty repair. When choosing to update the standard manufacturer' s warranty to same business day repair, CompuCom can place spare parts at customer locations to facilitate same business day repairs. For next business day restoral levels and beyond, CompuCom utilizes the advantages of its centralized spare parts depot for overnight delivery of replacement parts.

Depot Support - When customers prefer, equipment can be walked into one of our six service locations strategically placed throughout the state of California.

Centralized Laptop Depot - As an option to traditional warranty repair, you can upgrade to CompuCom' s Mobile Computing Services (MCS) which provides a convenient laptop repair service program for our customers. Because laptop users are typically not stationary, a specialized support program is necessary. MCS will maximize end-user uptime and minimize productivity losses.

THE VALUE IN PARTNERING: COVERING EVERY CORNER

In order to extend our geographical capabilities into every corner of California and offer you the convenience and consistency of a single point of contact for all your agency offices, CompuCom has developed subcontracting relationships with two best-of-class third-party service providers; NuFocus, Inc., and Panda TPM, Inc.

CompuCom' s subcontracting partners are industry leaders- well established and recognized for their respective excellence in service. To become a CompuCom third-party provider, a stringent screening process is conducted. An understanding of the joint cultures is presented, and each party is integrated into the mainstream of CompuCom' s proven processes. Guidelines for performance standards are established prior to engagement. These steps, taken to ensure smooth delivery of service, will result in minimal downtime for the end-user and ultimately the very best in customer satisfaction.

NuFocus, Inc. has been in hardware maintenance service business since 1985. NuFocus's world wide network of service technicians allows them to support manufacturer warranties on virtually all brands of computer and peripheral equipment throughout the United States, Canada, Mexico and other world cities. With more than 140 service locations in California, NuFocus will serve as one of CompuCom' s first-line outsource subcontractor for warranty and maintenance services for the State Computer Store contract. NuFocus focuses on providing information technology services to selected markets including the government sector. In 1999, CompuCom formed a partnership with NuFocus to provide its clients with a seamless, single point of contact for supporting multi-vendor desktop and network systems. The agreement leverages both companies' geographic coverage, complementary skills, and service infrastructures, providing our customers with a

complete range of service in all areas of California. CompuCom' s subcontracting relationship with NuFocus will offer our State Computer Store customers:

- Vendor neutral service for PCs, servers, printers, monitors, peripherals, routers, hubs, modems, and other networking components
- Service capability that provides consistent, reliable service in the far corners of California

CompuCom has established communication interfaces with NuFocus to integrate call reception, dispatch, and other support systems. In addition, dedicated staff within CompuCom' s Field Support Services Team communicates call information between our Service Information Management System (SIMS) and NuFocus's FocusPoint, an Internet Based Call Tracking system. Our staff has direct access to the FocusPoint system. As changes occur in call status, updates from Focus' sFocusPoint system are entered into CompuCom' s SIMS. Actively monitoring both systems ensures consistent information transfer.

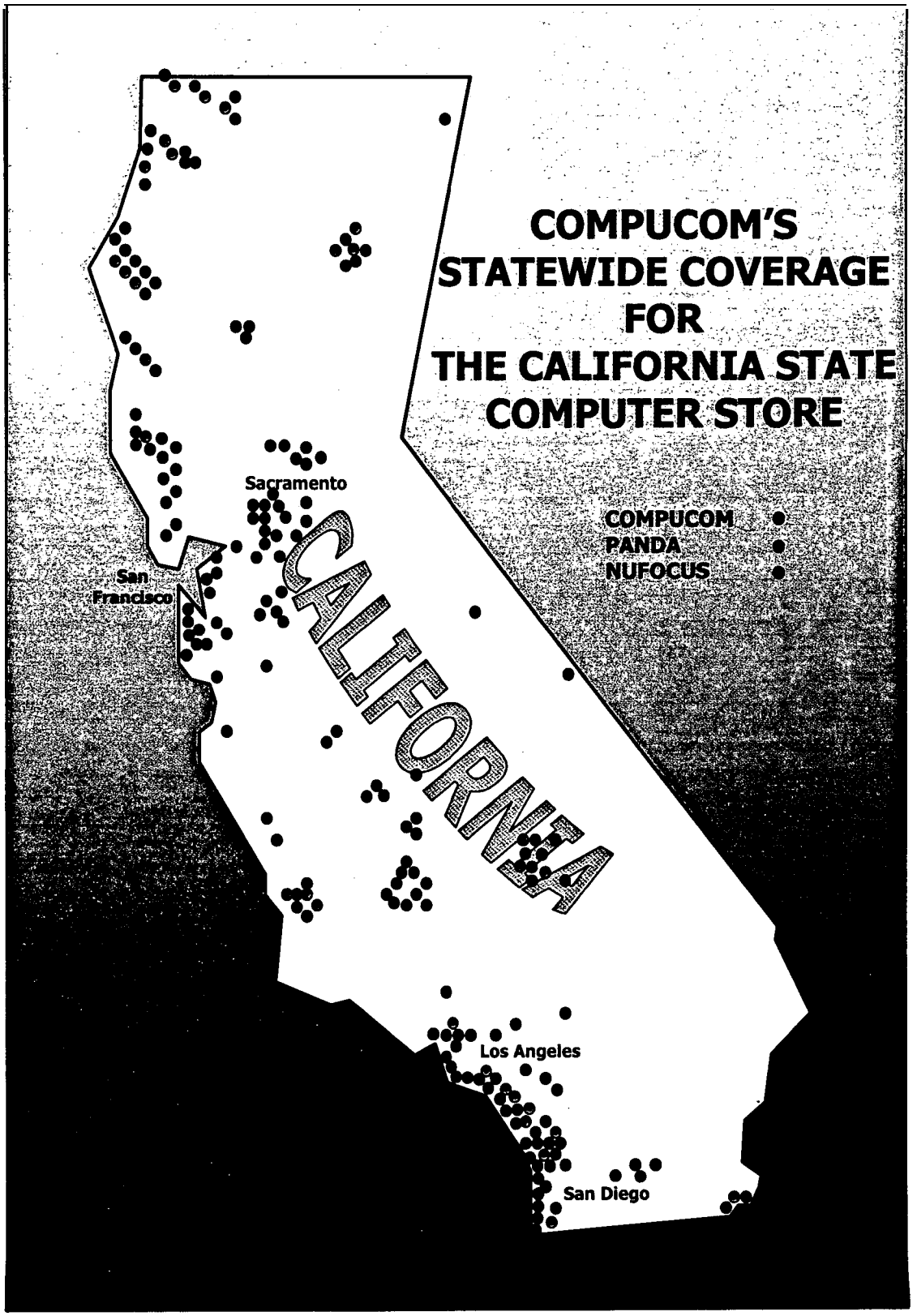
PANDA TPM, Inc.

Founded and managed by service professionals, Arlington TX-based Panda TPM is known in the industry as one of the most responsive, flexible, quality maintenance service companies in the industry. In California alone they maintain 125 service locations. The sole business of this minority-owned company is warranty and maintenance; therefore all management effort is focused on being the very best at what they do.

CompuCom' s reporting relationship with Panda TPM is the same as with NuFocus. When CompuCom dispatches a service call to Panda TPM, the performance standards CompuCom customers have come to rely on are ensured because we interface with Panda' s call monitoring system and track each request with SIMS until the call is resolved.

The following page shows a map detailing our thorough warranty service coverage as a result of our partnerships with NuFocus and Panda TPM.

CompuCom


COMPUCOM'S
STATEWIDE COVERAGE
FOR
THE CALIFORNIA STATE
COMPUTER STORE
Sacramento
CALIFORNIA
San
Francisco
COMPUCOM
PANDA
NUFOCUS
Los Angeles
San Diego

COMPUCOM -YOUR SINGLE POINT OF CONTACT

CompuCom' s Field Support Specialist Team manages the schedules and workloads of our engineers and the dispatching of third-party providers. A Field Support Specialist answers the call and performs first level triage to determine the nature of the problem and whether replacement parts are necessary. By providing initial triage, first call fix rates increase and the end-user' s downtime is minimized. CompuCom warrants that they will act as the single point of contact to customer agencies acquiring software and hardware.

ALL YOUR PRODUCTS - ALL YOUR AREAS

CompuCom honors manufacturer' s warranty repair services on all products offered through the State Computer Store. By utilizing our own service engineers along with those of NuFocus and Panda TPM, we ensure prompt, responsive service in *all* areas throughout the state.

HELP AT YOUR FINGERTIPS - EVERY HOUR OF EVERY DAY

It all starts with the touch of a button. When placing a service call through our State Computer Store, toll free dedicated number **(1-800-488-8409),** you will be greeted in person with, ***"Thank You for calling the California State Computer Store Service Department."*** The service department is available any hour of any day and is staffed with a Field Support Services Team who understands the terms and conditions of the State Computer Store contract, and more specifically, understands the needs of our agency customers. The Field Support Specialist Team members will have access to your agency' s service level contract requirements and will be able to quickly dispatch a service engineer and, if requested, guide you to CompuCom' s nearest service location.

SIMS AND AIRTIME - COMPUCOM'S PROPRIETARY CALL MANAGEMENT GEMS

Service request information is entered into CompuCom' s proprietary Service Information Management System (SIMS). This system is used to track all service calls (including those dispatched to a third-party), and facilitates the complete call management process including status, completion date, logistics, and systematic call escalation. Additionally, this system provides standard reports that give you the critical information needed to identify and follow problem trends and make strategic decisions, as well as monitor service contract level compliance.

For problems where the needed part(s) cannot be remotely identified, an engineer is dispatched with a field service kit in order to identify the required part(s) and resolve the issue. If the part required must be ordered the engineer will be notified once the part has arrived and will return to the site for full resolution.

The arrival of engineers to the customer' s site is coordinated within the parameters of our customer' s service contract requirements. The Field Support Specialists proactively track calls and service contract level requirements to verify parts arrival at the site, contract compliance, and final resolution of the issue.